

## CLAIMS

What is claimed is:

1           1. An electric current control method for use in an electric current control  
2 apparatus connected with at least a first electronic device and a second electronic device,  
3 to allow the electric current control apparatus to rectify, amplify and output an electric  
4 current from a current source under a condition free of additional power supply, the  
5 electric current control method comprising the steps of:

6           (1) having the electric current control apparatus rectify and amplify electric  
7 power of a finite current source that is inputted from a transmission interface of the  
8 first electronic device to the electric current control apparatus; and

9           (2) having the electric current control apparatus transmit the rectified and  
10 amplified electric power to the second electronic device through a transmission  
11 interface of the second electronic device.

1           2. The electric current control method of claim 1, wherein the step (1) comprises  
2 the procedures of:

3           (1-1) having the electric current control apparatus charge up a charger module  
4 thereof with the electric current of the finite current source from the  
5 transmission interface of the first electronic device; and

6           (1-2) having the electric current control apparatus combine an electric current  
7 from the charger module and the electric current of the finite current source  
8 from the transmission interface of the first electronic device, and transmit the  
9 combined electric current to the second electronic device through the  
10 transmission interface of the second electronic device.

1           3. The electric current control method of claim 1, wherein the electric current  
2 control apparatus is allowed to regulate and filter a rated electric current of the finite  
3 current source from the transmission interface of the first electronic device, and transmit

4 the processed rated electric current to the second electronic device through the  
5 transmission interface of the second electronic device.

4. The electric current control method of claim 1, wherein the step (1)  
comprises the procedures of:

(1-1) amplifying the electric power from the transmission interface of the  
first electronic device to have a first stage of voltage;

(1-2) amplifying the first stage of voltage to reach a second stage of voltage;  
and

(1-3) amplifying the second stage of voltage to reach a third stage of  
voltage.

1 5. The electric current control method of claim 4, wherein the first stage of  
2 voltage is 4 volts.

1 6. The electric current control method of claim 4, wherein the second stage of  
2 voltage is 4.8 volts.

1 7. The electric current control method of claim 4, wherein the third stage of  
2 voltage is 4.95 volts.

1 8. The electric current control method of claim 1, wherein the transmission  
2 interface of the first electronic device is selected from the group consisting of a USB  
3 interface, PCMCIA interface, and IEEE 1394 interface.

1 9. The electric current control method of claim 1, wherein the first electronic  
2 device is selected from the group consisting of a notebook computer and personal  
3 computer.

1 10. The electric current control method of claim 1, wherein the transmission

2 interface of the second electronic device is selected from the group consisting of a USB  
3 interface, PCMCIA interface, and IEEE 1394 interface.

1 11. The electric current control method of claim 1, wherein the second electronic  
2 device is selected from the group consisting of a HDD, CD-ROM, and CD-R.

1 12. An electric current control apparatus connected with at least a first electronic  
2 device and a second electronic device, to rectify, amplify and output an electric current  
3 from a current source under a condition free of additional power supply, the electric  
4 current control apparatus comprising:

5 a charger module charged by an electric current of a finite current source that is  
6 inputted to the electric current control apparatus from a transmission interface of the first  
7 electronic device, wherein the charger module after being charged serves as a power  
8 source to provide an electric current which is combined with the electric current of the  
9 finite current source inputted to the electric current control apparatus, to allow the  
10 combined electric current to be transmitted to the second electronic device through a  
11 transmission interface of the second electronic device.

1 13. The electric current control apparatus of claim 12, further comprising:

2 an electric-current control circuit module for controlling and monitoring the electric  
3 current of the finite current source from the transmission interface of the first electronic  
4 device and for charging up the charger module; and

5 a power combination control module having a combination switch and actuated by  
6 the electric-current control circuit module to combine the electric current of the finite  
7 current source from the first electronic device and the electric current from the charger  
8 module when the charger module is charged to have a predetermined voltage, so as to  
9 allow the combined electric current to be transmitted to the second electronic device.

1 14. The electric current control apparatus of claim 13, wherein the electric-current

2 control circuit module comprises:

3 a finite current charge circuit for receiving the electric current of the finite  
4 current source from the transmission interface of the first electronic device to charge  
5 the charger module with the received electric current;

6 a current amplification circuit for providing a supplementary current to the  
7 charging electric current, wherein when the charger module is charged to have a first  
8 predetermined voltage, the charging electric current from the finite current charge  
9 circuit is decreased to be below a first predetermined current value, and the current  
10 amplification circuit provides the supplementary current of a second predetermined  
11 current value to keep charging the charger module; and

12 a microprocessor circuit for controlling and monitoring the finite current charge  
13 circuit and the current amplification circuit to determine a process for charging the  
14 charger module with a constant electric current, wherein when the charger module is  
15 charged to have a second predetermined voltage, the combination switch of the  
16 power combination control module is actuated to allow the power combination  
17 control module to combine the electric current of the finite current source from the  
18 first electronic device and the electric current from the charger module and transmit  
19 the combined electric current to the second electronic device.

1 15. The electric current control apparatus of claim 14, wherein the first  
2 predetermined voltage is 4 volts, the first predetermined current value is 100mA, the  
3 second predetermined voltage is 4.8 volts, and the second predetermined current value is  
4 300mA.

1 16. The electric current control apparatus of claim 12, wherein the charger module  
2 is allowed to regulate and filter the electric current of the finite current source inputted  
3 into the electric current control apparatus.

1 17. The electric current control apparatus of claim 12, wherein the transmission

2 interface of the first electronic device is selected from the group consisting of a USB  
3 interface, PCMCIA interface, and IEEE 1394 interface.

1 18. The electric current control apparatus of claim 12, wherein the first electronic  
2 device is selected from the group consisting of a notebook computer and personal  
3 computer.

1 19. The electric current control apparatus of claim 12, wherein the transmission  
2 interface of the second electronic device is selected from the group consisting of a USB  
3 interface, PCMCIA interface, and IEEE 1394 interface.

1 20. The electric current control apparatus of claim 12, wherein the second  
2 electronic device is selected from the group consisting of a HDD, CD-ROM, and CD-R.